

10/605,773

NOV 30 2005

REMARKS

Claims 1, 4-21, 24-35, and 37-40, all the claims pending in the application, stand rejected on prior art grounds. In addition, the drawings and specification are objected to. Applicants respectfully traverse these objections/rejections based on the following discussion.

I. The Prior Art Rejections

Claims 1, 8, 9 and 10 stand rejected under 35 U.S.C. §102(b) as being anticipated by Van Os et al., hereinafter "Van Os" (5,708,556 in view of Guyot (5,885,423) and Di Milia et al. 4,551,192. Claims 5, 6, 11, and 12 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Van Os, Guyot, Di Milia, further in view of Shiota (5,956,837). Claims 7 and 13 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Van Os. Claims 14-16, 18, 19, 21, 25, 26, 28-31, 33-35, 37, 39, and 40 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Van Os, Guyot, Di Milia, in view of Shiota and Lund. Claims 20 and 24 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Van Os, Guyot, Di Milia, in view of Shiota, Lund, and Or. Claims 4, 17, and 38 stand rejected under 35 U.S.C. §102(b) as being anticipated by Van Os in view of Di Milia and Abdo et al., hereinafter "Abdo" (6,806,007). Applicants respectfully traverse these rejections based on the following discussion.

A. The Rejection Based on Van Os, Guyot and Di Milia

Applicants' respectfully submit that the proposed combination of Van Os, Guyot, and Di Milia does not teach or suggest electrostatic pins connected to height adjustment mechanisms (claims 1 and 8) or that the height of individual electrostatic pins can be adjusted to compensate for deformities (claim 1). Thus, as discussed in detail below, it is Applicants' position that independent claims 1 and 8 (and dependent claims 9 and 10) are patentable over the proposed combination of Van Os, Guyot, and Di Milia.

10/605,773

The Office Action proposes that it would have been obvious to substitute the cable-controlled, synchronized lifting pins 140 of Guyot for the lifting pins 88 in Van Os that are all fixed to the yoke member 92. The Office Action also proposes that it would have been obvious to substitute the electrostatic pins 30 of Di Milia for the lifting pins 88 in Van Os. However, this rejection is defective for failing set forth a *prima facie* case of obviousness because the Office Action does not identify where the motivational teaching for these modifications of Van Os appear in the record. To the contrary, each proposed modification of Van Os is accompanied by vague unsupported reasoning including that the modifications would make "the design more compact and versatile" and that the modifications would "provide an improved holding force between the wafer and the electrostatic pin chuck." Therefore, Applicants respectfully submit that the rejection is defective on its face even before any consideration of the merits of such proposed modifications to Van Os.

Further, the proposed modification of Van Os that makes the lifting pins electrostatic in nature destroys the operability of the Van Os device and therefore would not have been considered by one ordinarily skilled in the art. More specifically, the function of the lifting pins 88 in Van Os is to separate the wafer from the electrostatic chuck 20. If the lifting pins 88 are changed to electrostatic pins (e.g., the lifting pins become the electrostatic chuck) as proposed in the Office Action, there would be no mechanism to lift the wafer off the electrostatic chuck since the pins would then be the electrostatic chuck. In other words, the function of the lifting pins 88 is to lift the wafer off the electrostatic chuck. If the lifting pins become the electrostatic chock, their function as lifting pins is destroyed. If a proposed modification to a reference destroys the function of that reference, this demonstrates that it would not have been obvious to one ordinarily skilled in the art to so modify the reference. Therefore, again, the rejection is defective because a *prima facie* case of obviousness has not been established.

Also, Van Os already contains an electrostatic chuck 20. As mentioned above, the Office Action proposes modifying the lifting pins 88 into an electrostatic chuck. However, making the lifting pins 88 also an electrostatic chuck would introduce a redundant and unnecessary electrostatic chuck into the structure. Applicants respectfully submit that one of the primary defects of the rejection is that lifting pins are

10/605,773

fundamentally different structures than electrostatic chucks. The two devices have fundamentally different functions, the chuck grasps the wafer, while the lifting pins lift the wafer off the chuck. These functions are so fundamentally different that one item cannot be substituted for the other. Attempting to modify the lifting pins as is proposed in the Office Action so that they become electrostatic is an unreasonable modification of the reference which would not have been performed by one ordinarily skilled in the art.

During examination of the current claims, it is apparent that no prior art reference was found that included adjustment mechanisms connected to electrostatic chuck pins. Therefore, Applicants submit that the Examiner engaged in hindsight reasoning in proposing to modify the lifting pins 88 of Van Os into electrostatic chuck pins. Such hindsight reasoning is impermissible and improper, and is additional support for Applicants' position that the rejection is defective and should be removed.

In column 7, lines 14-27, Van Os explains that the "lifting pins 88" are carried by a yoke member 92 and that the movement of the lifting pins is "synchronized with the yoke member" indicating that all the lifting pins are moved together. In column 3, lines 43-59, Guyot explains that while independent cable and sleeve assemblies are utilized, such assemblies are utilized "to lift the pins 140 simultaneously" (column 3, line 55). Thus, while Guyot substitutes independent cable and sleeve assemblies for a common yoke member, such assemblies are not independently controlled, but instead are structured to operate synchronously to move the pins simultaneously.

Since both Van Os and Guyot explain that the movement of the lifting pins is "synchronized with the yoke member," (column 7, lines 15-27 of Van Os) and that the assemblies are utilized "to lift the pins 140 simultaneously" (column 3, lines 43-59 of Guyot) this indicates that all the lifting pins are moved together. To the contrary, with the claimed invention, the "height adjustment mechanisms individually adjust positions of said electrostatic chuck pins to compensate for flatness deformities in a device being held by said electrostatic chuck pins" (claim 1). Because the proposed combination of Van Os and Guyot connects the pins to a yoke or connects the pins to simultaneously controlled cable and sleeve assemblies, the pins must move together and cannot have independent movement, as is allowed in the claimed invention. Therefore, the proposed modification of Van Os using Guyot is further deficient in teaching that the pins are

10/605,773

independently controlled and therefore cannot teach the invention defined by independent claim 1.

With respect to some functional limitations and elements that are "adapted to" perform a function, the Office Action concludes that these claim sections do "not constitute a limitation in any patentable sense." Such a statement is entirely incorrect and inconsistent with the MPEP. More specifically MPEP § 2173.05(g) states that a "functional limitation must be evaluated and considered, just like any other limitation of the claim, for what it fairly conveys to a person of ordinary skill in the pertinent art in the context in which is used." Further, MPEP §2173.05(g) explains that terminology such as "adapted to" serves to precisely defines present "structural" attributes of interrelated component parts of the claimed assembly (*In re Venezia*, 530 F.2d 956, 189 USPQ 149 (CCPA 1976)). Therefore, the claimed "adapted to" limitations must be examined as being "structural" in nature and must be considered, just like any other limitation.

In view of the foregoing, it is Applicants' position that the proposed combination of Van Os, Guyot, and Di Milia does not teach or suggest "height adjustment mechanisms" with "electrostatic chuck pins" (claim 1) or "electrostatic pins" (claim 8), or that the "height adjustment mechanisms individually adjust positions of said electrostatic chuck pins" (claim 1). Therefore, independent claims 1 and 8 are patentable over the proposed combination of Van Os, Guyot, and Di Milia. Further, dependent claims 9 and 10 are similarly patentable, not only because they depend from patentable independent claim 8, but also because of the additional features of the invention they define. In view of the foregoing, the Examiner is respectfully requested to reconsider and withdraw this rejection.

B. The Rejection Based on Van Os, Guyot, Di Milia and Shiota

Dependent claims 5, 6, 11, and 12, as well as independent claims 1 and 8, are not taught or suggested by this proposed combination of references. Applicants' respectfully submit that the proposed combination of Van Os, Guyot, Di Milia, and Shiota does not teach or suggest electrostatic chuck pins connected to height adjustment mechanisms (claims 1 and 8) or that the height of individual electrostatic pins can be adjusted to

10/605,773

compensate for deformities (claim 1). Thus, as discussed in detail below, it is Applicants' position that independent claims 1 and 8 (and dependent claims 5, 6, 11, and 12) are patentable over the proposed combination of Van Os, Guyot, Di Milia, and Shiota.

As shown above, the proposed combination of Van Os, Guyot, and Di Milia does not teach or suggest "height adjustment mechanisms" with "electrostatic chuck pins" (claim 1) or "electrostatic pins" (claim 8), or that the "height adjustment mechanisms individually adjust positions of said electrostatic chuck pins" (claim 1). In column 3, lines 56-58, Shiota explains that the "lifting pins 5" are supported by a lifting stand 51 which moves all of the lifting pins 5 simultaneously. Therefore, in Shiota the lifting pins 5 are structured to operate synchronously to move the pins simultaneously in a very similar manner to Van Os and Guyot.

Since Van Os, Guyot, and Shiota all explain that the movement of the lifting pins is "synchronized with the yoke member," (column 7, lines 15-27 of Van Os), that the assemblies are utilized "to lift the pins 140 simultaneously" (column 3, lines 43-59 of Guyot), and that the lifting stand 51 supports the lifting pins 5 (column 3, line 54-column 4, line 4 of Shiota) this indicates that all the lifting pins are moved together. To the contrary, with the claimed invention, the "height adjustment mechanisms individually adjust positions of said electrostatic chuck pins to compensate for flatness deformities in a device being held by said electrostatic chuck pins" (claim 1). Because the proposed combination of Van Os, Guyot, and Shiota connects the pins to a yoke, commonly controlled cables, or a lifting stand, the pins must move together and cannot have independent movement, as is allowed in the claimed invention. Therefore, the proposed combination of Van Os, Guyot, Di Milia, and Shiota is further deficient in teaching that the pins are independently controlled and therefore cannot teach the invention defined by independent claim 1.

In view of the foregoing, it is Applicants' position that the proposed combination of Van Os, Guyot, Di Milia, and Shiota does not teach or suggest "height adjustment mechanisms" with "electrostatic chuck pins" (claim 1) or "electrostatic pins" (claim 8), or that the "height adjustment mechanisms individually adjust positions of said electrostatic chuck pins" (claim 1). Therefore, independent claims 1 and 8 are patentable over the proposed combination of Van Os, Guyot, Di Milia, and Shiota. Further, dependent

10/605,773

claims 5, 6, 11, and 12 are similarly patentable, not only because they depend from patentable independent claims 1 and 8, but also because of the additional features of the invention they define. In view of the foregoing, the Examiner is respectfully requested to reconsider and withdraw this rejection.

C. The Rejection Based on Van Os, Guyot, Di Milia and Or

Dependent claims 7 and 13, as well as independent claims 1 and 8, are not taught or suggested by this proposed combination of references. Applicants' respectfully submit that the proposed combination of Van Os, Guyot, Di Milia, and Or does not teach or suggest electrostatic chuck pins connected to height adjustment mechanisms (claims 1 and 8) or that the height of individual electrostatic pins can be adjusted to compensate for deformities (claim 1). Thus, as discussed in detail below, it is Applicants' position that independent claims 1 and 8 (and dependent claims 7 and 13) are patentable over the proposed combination of Van Os, Guyot, Di Milia, and Or.

As shown above, Van Os, Guyot, and Di Milia does not teach or suggest "height adjustment mechanisms" with "electrostatic chuck pins" (claim 1) or "electrostatic pins" (claim 8), or that the "height adjustment mechanisms individually adjust positions of said electrostatic chuck pins" (claim 1). In paragraph 14, Or explains that the "lift pins 120" are supported by a lift plate 124 which moves all of the lift pins 120 simultaneously. Therefore, in Or the lift pins 120 are structured to operate synchronously to move the pins simultaneously.

Since Van Os, Guyot, and Or all explain that the movement of the lifting pins is "synchronized with the yoke member," (column 7, lines 15-27 of Van Os), that the assemblies are utilized "to lift the pins 140 simultaneously" (column 3, lines 43-59 of Guyot), and that the lift plate 124 moves all of the lift pins 120 simultaneously (paragraph 14 of Or) this indicates that all the lifting pins are moved together. To the contrary, with the claimed invention, the "height adjustment mechanisms individually adjust positions of said electrostatic chuck pins to compensate for flatness deformities in a device being held by said electrostatic chuck pins" (claim 1). Because the proposed combination of Van Os, Guyot, and Or connects the pins to a yoke, commonly controlled cables, or a lift

10/605,773

plate, the pins must move together and cannot have independent movement, as is allowed in the claimed invention. Therefore, the proposed combination of Van Os, Guyot, Di Milia, and Or is further deficient in teaching that the pins are independently controlled and therefore cannot teach the invention defined by independent claim 1.

In view of the foregoing, it is Applicants' position that the proposed combination of Van Os, Guyot, Di Milia, and Or does not teach or suggest "height adjustment mechanisms" with "electrostatic chuck pins" (claim 1) or "electrostatic pins" (claim 8), or that the "height adjustment mechanisms individually adjust positions of said electrostatic chuck pins" (claim 1). Therefore, independent claims 1 and 8 are patentable over the proposed combination of Van Os, Guyot, Di Milia, and Or. Further, dependent claims 7 and 13 are similarly patentable, not only because they depend from patentable independent claims 1 and 8, but also because of the additional features of the invention they define. In view of the foregoing, the Examiner is respectfully requested to reconsider and withdraw this rejection.

D. The Rejection Based on Van Os, Guyot, Di Milia, Shiota and Lund

Independent claims 14, 21, 28, and 35 as well as dependent claims 16, 18, 19, 21, 25, 26, 28, 29, 31, 33-35, 37, 39, and 40, are not taught or suggested by this proposed combination of references. Applicants' respectfully submit that the proposed combination of Van Os, Guyot, Di Milia, Shiota, and Lund does not teach or suggest that the pins can be individually controlled (claims 21 and 35) or that the pins are "electrostatic pins" and are connected to "height adjustment mechanisms" (claims 14, 21, 28, and 35). Thus, as discussed in detail below, it is Applicants' position that independent claims 14, 21, 28, and 35 (and dependent claims 16, 18, 19, 21, 25, 26, 28, 29, 31, 33-35, 37, 39, and 40) are patentable over the proposed combination of Van Os, Guyot, Di Milia, Shiota, and Lund.

As shown above, the proposed combination of Van Os, Guyot, Di Milia, and Shiota does not teach or suggest that the pins can be individually controlled (claims 21 and 35) or that the pins are "electrostatic pins" and are connected to "height adjustment mechanisms" (claims 14, 21, 28, and 35). While Lund discloses a vacuum chuck 122

10/605,773

(column 5, line 13) Lund does not disclose any form of structure which would lift the vacuum chuck and is only referenced in the Office Action for the purposes of showing that a computer can monitor measurement tools:

Lund discloses a system for chemically and mechanically polishing a semiconductor wafer that determines the thickness of the wafer surface film during the polishing process with a real time measurement device, or by determining a work-performed factor and calculating an estimated film thickness from the work-performed factor, and does not disclose measuring the "flatness" of the device (Lund, Abstract). Nowhere does Lund suggest that features of the vacuum chuck 122 should be adjusted to control the flatness of the device being polished. Instead, Lund measures only the thickness of the surface of the device being polished. Lund does not measure flatness and Lund does not teach or suggest adjusting the chuck to control flatness. There is nothing in any of the references that would suggest using the computerized real time measurement in Lund as a way of adjusting features of an electrostatic chuck, much less a method/system that adjusts individual electrostatic pins in order to improve flatness of the device being held by the chuck. Instead, the most that Lund can teach is monitoring a surface thickness during a polishing process, which is not a claimed feature.

To the contrary, the claimed invention can "adjust said flatness of said device by adjusting said height adjustment mechanisms" (claim 14), "adjust said flatness of said device by individually adjusting said height adjustment mechanisms" (claim 21), provide a process of "adjusting the height of said electrostatic pins to correct any flatness errors" (claim 28) and of "individually adjusting the height of height adjustment mechanisms connected between said electrostatic chuck pins and a plate of said electrostatic chuck to correct any flatness errors" (claim 35). Because the proposed combination of Van Os, Guyot, Di Milia, and Shiota, connects the pins to a yoke, commonly controlled cables, or lifting stand, the pins must move together and cannot have independent movement, as is allowed in the claimed invention. Again, Lund discloses nothing about controlling electrostatic pins to control the flatness of a device. Therefore, the proposed combination of Van Os, Guyot, Di Milia, Shiota, and Lund is further deficient in teaching that the pins are controlled to adjust flatness (claims 14, 21, 28, and 35) or that the pins are independently controlled (claims 21 and 35).

10/605,773

In view of the foregoing, it is Applicants' position that the proposed combination of Van Os, Shiota, and Lund does not teach or suggest "height adjustment mechanisms" with "electrostatic chuck pins" (claims 21 and 35) or "electrostatic pins" (claims 14 and 28), or that the invention can "adjust said flatness of said device by adjusting said height adjustment mechanisms" (claim 14), "adjust said flatness of said device by individually adjusting said height adjustment mechanisms" (claim 21), provide a process of "adjusting the height of said electrostatic pins to correct any flatness errors" (claim 28) and of "individually adjusting the height of height adjustment mechanisms connected between said electrostatic chuck pins and a plate of said electrostatic chuck to correct any flatness errors" (claim 35). Therefore, independent claims 14, 21, 28, and 35 are patentable over the proposed combination of Van Os, Guyot, Di Milia, Shiota, and Lund. Further, dependent claims 16, 18, 19, 21, 25, 26, 28, 29, 31, 33-35, 37, 39, and 40 are similarly patentable, not only because they depend from patentable independent claims 14, 21, 28, and 35, but also because of the additional features of the invention they define. In view of the foregoing, the Examiner is respectfully requested to reconsider and withdraw this rejection.

E. The Rejection Based on Van Os, Guyot, Di Milia, Shiota, Lund, and Or

Independent claims 14 and 21 as well as dependent claims 20 and 24 are not taught or suggested by this proposed combination of references. Applicants' respectfully submit that the proposed combination of Van Os, Guyot, Di Milia, Shiota, Lund, and Or does not teach or suggest that the pins are "electrostatic pins" and are connected to "height adjustment mechanisms" (claims 14 and 21). Thus, as discussed in detail below, it is Applicants' position that independent claims 14 and 21 (and dependent claims 20 and 24) are patentable over the proposed combination of Van Os, Guyot, Di Milia, Shiota, Lund, and Or.

As shown above, the proposed combination of Van Os, Guyot, Di Milia, Shiota, and Lund does not teach or suggest that the pins can be individually controlled (claim 21) or that the pins are "electrostatic pins" and are connected to "height adjustment

10/605,773

mechanisms" (claims 14 and 21). Or explains that the "lift pins 120" are supported by a lift plate 124 which moves all of the lift pins 120 simultaneously. Therefore, in Or the lift pins 120 are structured to operate synchronously to move the pins simultaneously.

To the contrary, the claimed invention can "adjust said flatness of said device by adjusting said height adjustment mechanisms" (claim 14) or "adjust said flatness of said device by individually adjusting said height adjustment mechanisms" (claim 21).

Because the proposed combination of Van Os, Guyot, Shiota, and Or connect the pins to a yoke, commonly controlled cables, or lifting stand, lifting plate, etc., the pins must move together and cannot have independent movement, as is allowed in the claimed invention. Therefore, the proposed combination of Van Os, Guyot, Di Milia, Shiota, Lund, and Or is further deficient in teaching that the pins are controlled to adjust flatness (claims 14 and 21) or that the pins are independently controlled (claims 21 and 35).

In view of the foregoing, it is Applicants' position that the proposed combination of Van Os, Guyot, Di Milia, Shiota, Lund, and Or does not teach or suggest "height adjustment mechanisms" with "electrostatic chuck pins" (claim 21) or "electrostatic pins" (claim 14), or that the invention can "adjust said flatness of said device by adjusting said height adjustment mechanisms" (claim 14), or "adjust said flatness of said device by individually adjusting said height adjustment mechanisms" (claim 21). Therefore, independent claims 14 and 21 are patentable over the proposed combination of Van Os, Guyot, Di Milia, Shiota, Lund, and Or. Further, dependent claims 20 and 24 are similarly patentable, not only because they depend from patentable independent claims 14 and 21, but also because of the additional features of the invention they define. In view of the foregoing, the Examiner is respectfully requested to reconsider and withdraw this rejection.

F. The Rejection Based on Van Os, Di Milia, and Abdo

Independent claims 4, 17, and 35 as well as dependent claim 38 are not taught or suggested by this proposed combination of references. Applicants' respectfully submit that the proposed combination of Van Os, Di Milia, and Abdo does not teach or suggest that the pins are "electrostatic pins" and are connected to "height adjustment

10/605,773

"mechanisms" (claims 4, 17, and 35). Thus, as discussed in detail below, it is Applicants' position that independent claims 4, 17, and 35 (and dependent claim 38) are patentable over the proposed combination of Van Os, Di Milia, and Abdo.

As shown above, the proposed combination of Van Os and Di Milia does not teach or suggest that the pins are "electrostatic pins" and are connected to "height adjustment mechanisms" (claims 4, 17, and 35). The Office Action proposes that Abdo discloses electrostatic chuck pins 1304 that can be adjusted. To the contrary, in a very similar manner to Van Os, items 1304 in Abdo are again merely "lift pins" that are part of a clamping plate 1306 (column 10, lines 5-25 of Abdo). There is nothing within Abdo which would teach or suggest to one ordinarily skilled in the art to modify the lift pins of Van Os into electrostatic pins.

In view of the foregoing, it is Applicants' position that the proposed combination of Van Os, Di Milia, and Abdo does not teach or suggest that the pins are "electrostatic pins" and are connected to "height adjustment mechanisms" (claims 4, 17, and 35). Thus, as discussed in detail below, it is Applicants' position that independent claims 4, 17, and 35 (and dependent claim 38) are patentable over the proposed combination of Van Os, Di Milia, and Abdo. Further, dependent claim 38 is similarly patentable, not only because it depends from patentable independent claim 35, but also because of the additional features of the invention it defines. In view of the foregoing, the Examiner is respectfully requested to reconsider and withdraw this rejection.

II. Formal Matters and Conclusion

One of the fundamental faults of the above rejections is the attempt to substitute electrostatic pins in place of the lifting pins 88 in Van Os. As shown above, one ordinarily skilled in the art would not have modified Van Os in that manner. The only reference that actually discusses electrostatic chuck pins is Di Milia, and this reference includes only fixed, non-movable electrostatic chuck pins. The only other references which discuss any form of pins only disclose lift pins, which would not be made into electrostatic pins. Therefore, there is no teaching, or reasonable modification of the references which would render obvious the most basic structure of the invention as

10/605,773

defined, for example, by independent claim 8 that includes adjustment mechanisms connected to electrostatic chuck pins. Therefore, as discussed in detail above, each of the foregoing rejections is defective and should be removed.

In view of the foregoing, Applicants submit that claims 1, 4-21, 24-35, and 37-40, all the claims presently pending in the application, are patentably distinct from the prior art of record and are in condition for allowance. The Examiner is respectfully requested to pass the above application to issue at the earliest possible time.

Should the Examiner find the application to be other than in condition for allowance, the Examiner is requested to contact the undersigned at the local telephone number listed below to discuss any other changes deemed necessary.

Please charge any deficiencies and credit any overpayments to Attorney's Deposit Account Number 09-0456.

Respectfully submitted,



Frederick W. Gibb, III
Reg. No. 37,629

Date: 11-30-05
Gibb I.P. Law Firm, LLC
2568-A Riva Road, Suite 304
Annapolis, Maryland 21401
(410) 573-1545
Customer No. 29154